Claims

What is claimed is:

1. A method, comprising:

a) rolling a vector of request values, said request values provided by a plurality of request agents, wherein said rolling of said vector results in a rolled vector that reflects a round robin grant eligibility hierarchy and wherein a position within said rolled vector is reserved for a request value that was provided by a request agent that is to be recognized as being eligible for a grant; and

b) extracting a first active request value that is observed in said rolled vector, starting from said position and extending in a direction toward a request value that is to be recognized as a request from a next request agent to be recognized as being grant eligible within said eligibility hierarchy.

2. The method of claim 1 wherein said position is the least significant position.

3. The method of claim 2 further comprising scanning said rolled vector for said first active request value, said scanning starting at said position.

4. The method of claim 3 further comprising issuing a grant to that request agent of said request agents whose request corresponds to said active request value.

5. The method of claim 1 wherein said position is the most significant position.

6. The method of claim 5 further comprising scanning said rolled vector for an active request value, said scanning starting at said position.

7. The method of claim 6 further comprising issuing a grant to that request agent of said request agents whose request corresponds to said active request value.

8. The method of claim 1 wherein said grant is a grant for bandwidth resources.

9. The method of claim 1 wherein said grant is a grant for routing resources.

10. The method of claim 1 wherein said grant is a grant for switching resources.

11. The method of claim 1 wherein said grant is a grant for processing resources.

12. The method of claim 1 wherein said extracted first active request value is first provided in an output vector arranged as said rolled vector is arranged.

13. The method of claim 12 further comprising un-rolling said output vector so as to produce a second output vector arranged as said vector of request values is arranged.

14. An apparatus, comprising:

a bit extraction unit that receives a rolled vector of request values, said request values provided by a plurality of request agents, wherein said rolled vector reflects a round robin grant eligibility hierarchy by having a request value that was provided by a request agent that is to be recognized as being grant eligible positioned at a position within said rolled vector, said bit extraction unit designed to extract a first active bit observed in said rolled vector, starting from said position and extending in a direction toward a request value that is to be recognized as a request from a next request agent to be recognized as being grant eligible within said eligibility hierarchy.

15. The apparatus of claim 14 wherein said position is the least significant position.

16. The apparatus of claim 15 wherein said bit extraction unit scans said rolled vector for an active bit, said scanning starting at said position.

17. The apparatus of claim 14 wherein said position is the most significant position.

18. The apparatus of claim 17 wherein said bit extraction unit scans said rolled vector for an active request value, said scanning starting at said position.

19. A method, comprising:

choosing, from a plurality of grant generation units, a grant generation unit that is to provide an output specifying which request agent, from a plurality of

30

request agents, is to receive a grant; wherein said plurality of grant generation units are arranged according to a round robin grant eligibility hierarchy, such that, one grant generation unit exists for each request agent; and wherein said chosen grant generation unit is chosen because its corresponding request agent is the next request agent in said round robin grant eligibility hierarchy to be recognized as being eligible for a grant.

20. The method of claim 19 further comprising providing an input vector of request values to said grant generation unit, said request values generated by said request agents.

21. The method of claim 20 further comprising rolling said input vector, said rolling of said vector resulting in a rolled vector that reflects said round robin grant eligibility hierarchy and wherein a position within said rolled vector is reserved for a request value that was provided by said corresponding request agent.

22. The method of claim 21 further comprising extracting a first active request value that is observed in said rolled vector, starting from said position and extending in a direction toward a request value that is to be recognized as a request from a next request agent to be recognized as being grant eligible within said eligibility hierarchy.

23. The method of claim 22 wherein said position is the least significant position.

24. The method of claim 23 further comprising scanning said rolled vector for said first active request value, said scanning starting at said position.

25. The method of claim 22 wherein said position is the most significant position.

26. The method of claim 25 further comprising scanning said rolled vector for an active request value, said scanning starting at said position.

27. The method of claim 22 further comprising issuing a grant to that request agent of said request agents whose request corresponds to said active request value.

28. The method of claim 27 wherein said grant is a grant for bandwidth resources.

29. The method of claim 27 wherein said grant is a grant for routing resources.

30. The method of claim 27 wherein said grant is a grant for switching resources.

31. The method of claim 27 wherein said grant is a grant for processing resources.

32. The method of claim 22 wherein said extracted first active request value is first provided in an output vector arranged as said rolled vector is arranged.

33. The method of claim 32 further comprising un-rolling said output vector so as to produce a second output vector arranged as said vector of request values is arranged.

34. An apparatus, comprising:

a plurality of grant generation units, wherein said plurality of grant generation units are arranged according to a round robin grant eligibility hierarchy, such that, one grant generation unit exists for each of a plurality of request agents; and wherein a grant generation unit is chosen to provide an output specifying which request agent, from said plurality of request agents is to receive a grant, said chosen grant generation unit being chosen because its corresponding request agent is the next request agent in said round robin grant eligibility hierarchy to be recognized as being eligible for a grant.

35. The apparatus of claim 34 wherein each of said grant generation units receive an input vector of request values.

36. The apparatus of claim 35 wherein each of said grant generation units roll said input vector to form a rolled vector, said rolled vector reflecting said round robin grant eligibility hierarchy and wherein a position within said rolled vector is reserved for a request value that was provided by the corresponding request agent for each of said grant generation units.

37. The apparatus of claim 36 wherein each of said grant generation units further comprise a bit extraction unit that extracts a first active request value that is observed in said rolled vector, starting from said position and extending in a direction toward a request value that is to be recognized as a request from a next request agent to be recognized as being grant eligible within said eligibility hierarchy.

38. The apparatus of claim 37 wherein said position is the least significant position.

39. The apparatus of claim 38 wherein said position is the most significant position.

40. The apparatus of claim 34 wherein said grant is for bandwidth resources.

41. The apparatus of claim 37 wherein each of said grant generation units provide their said extracted first active request value in an output vector arranged as said rolled vector is arranged.

42. The apparatus of claim 41 wherein each of said grant generation units un-roll their said output vector so as to produce a second output vector arranged as said vector of request values is arranged.

43. The apparatus of claim 34 wherein said grant is a grant for bandwidth resources.

44. The apparatus of claim 34 wherein said grant is a grant for routing resources.

45. The apparatus of claim 34 wherein said grant is a grant for switching resources.

46. The apparatus of claim 34 wherein said grant is a grant for processing resources.

47. A machine readable medium having stored thereon a description of a circuit, said circuit comprising:

a bit extraction unit that receives a rolled vector of request values, said request values provided by a plurality of request agents, wherein said rolled vector reflects a round robin grant eligibility hierarchy by having a request value that was provided by a request agent that is to be recognized as being grant eligible positioned at a position within said rolled vector, said bit extraction unit designed to extract a first active bit observed in said rolled vector, starting from said position and extending in a direction toward a request value that is to be recognized as a request from a next request agent to be recognized as being grant eligible within said eligibility hierarchy.

48. The machine readable medium of claim 47 wherein said position is the least significant position.

49. The machine readable medium of claim 48 wherein said bit extraction unit scans said rolled vector for an active bit, said scanning starting at said position.

50. The machine readable medium of claim 47 wherein said position is the most significant position.

51. The machine readable medium of claim 50 wherein said bit extraction unit scans said rolled vector for an active request value, said scanning starting at said position.

52. A machine readable medium having stored thereon a description of circuit, said description of a circuit comprising:

a plurality of grant generation units, wherein said plurality of grant generation units are arranged according to a round robin grant eligibility hierarchy, such that, one grant generation unit exists for each of a plurality of request agents; and wherein a grant generation unit is chosen to provide an output specifying which request agent, from said plurality of request agents is to receive a grant, said chosen grant generation unit being chosen because its corresponding request agent is the next request agent in said round robin grant eligibility hierarchy to-be recognized as being eligible for a grant.

53. The machine readable medium of claim 52 wherein each of said grant generation units receive an input vector of request values.

54. The machine readable medium of claim 53 wherein each of said grant generation units roll said input vector to form a rolled vector, said rolled vector reflecting said round robin grant eligibility hierarchy and wherein a position within said rolled vector is reserved for a request value that was provided by the corresponding request agent for each of said grant generation units.

55. The machine readable medium of claim 54 wherein each of said grant generation units further comprise a bit extraction unit that extracts a first active request value that is observed in said rolled vector, starting from said position and extending in a direction toward a request value that is to be recognized as a request from a next request agent to be recognized as being grant eligible within said eligibility hierarchy.